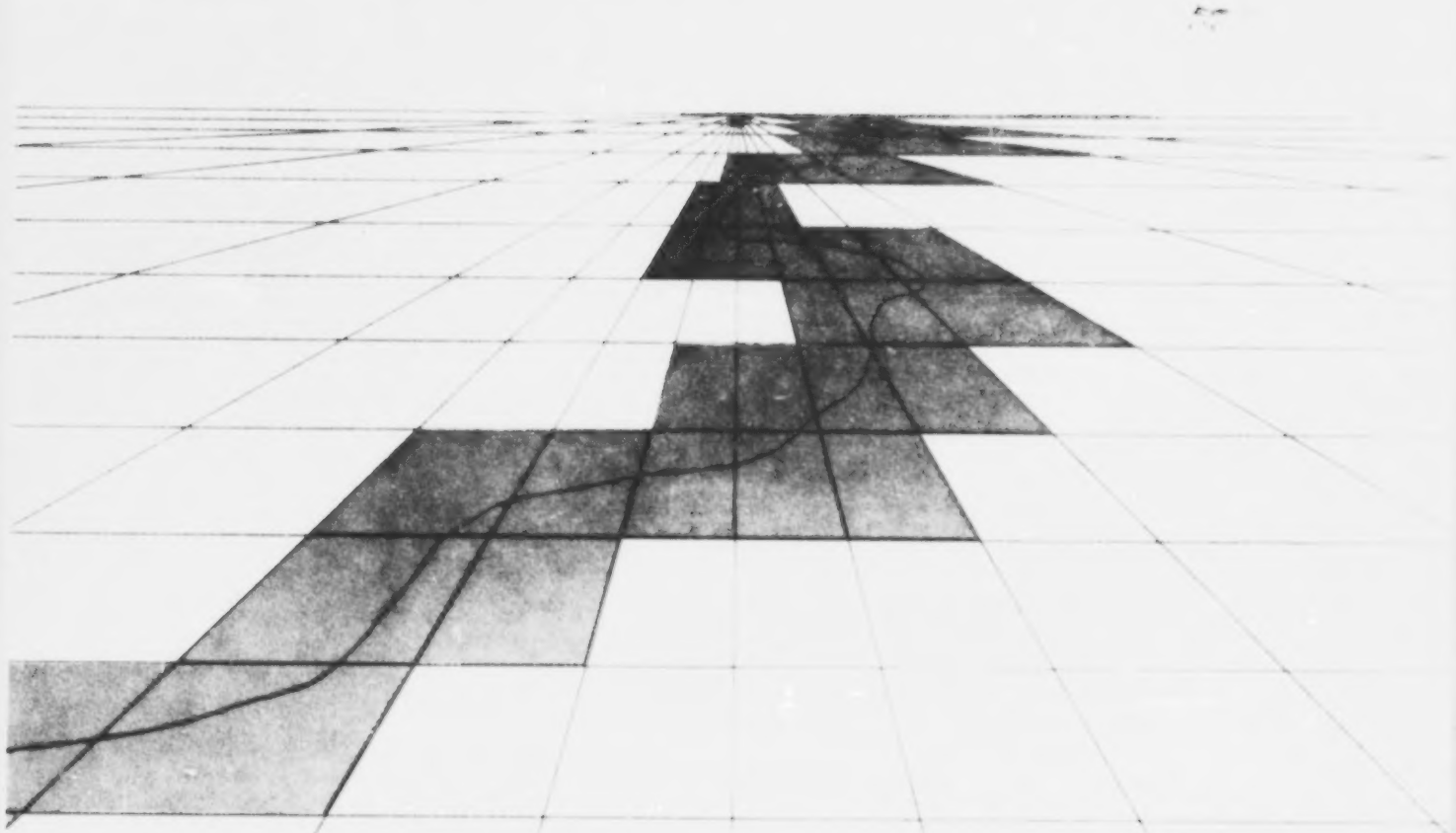
Canada–Ontario Flood Damage Reduction Program



Annual Review 1983–84

Environment Canada Environnement Canada

Ontario Ministry of Natural Resources Ministère des Richesses naturelles

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CANADA/ONTARIO FLOOD DAMAGE REDUCTION PROGRAM

ANNUAL REVIEW

1983/84

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CANADA/ONTARIO FLOOD DAMAGE REDUCTION PROGRAM

August 14, 1984

The Honourable Charles Caccia
Minister
Environment Canada
Ottawa, Ontario

The Honourable Alan W. Pope
Minister
Ontario Ministry of Natural Resources
Toronto, Ontario

Gentlemen:

We are pleased to submit the sixth Annual Review of the Steering Committee of the Canada/Ontario Flood Damage Reduction Program. The review outlines the work conducted between April 1, 1983 and March 31, 1984.

Yours sincerely,

H. A. Clarke

H. A. Clarke
Chairman, Steering Committee
Canada/Ontario Flood Damage Reduction Program

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HIGHLIGHTS OF THE 1983/84
CANADA/ONTARIO FLOOD DAMAGE REDUCTION PROGRAM

- In this sixth year of the agreement, the Flood Damage Reduction Program experienced a 22 per cent decrease in its expenditures over the last fiscal year. The decrease in spending was partially due to the provincially initiated decision to defer the final inking of floodlines on the flood risk maps and to delay recommending designations of flood risk areas until the Provincial Flood Plain Criteria Review has been completed.

- A total of 44 projects were funded in 1983/84, with shareable expenses of $1,183,280. To date, $7,025,117 has been spent of the total allocation of $9,200,000. Table 1 lists the program's expenditures from 1977/78 to 1983/84.

- The flood risk areas along the Kaministiquia River, in the City of Thunder Bay and the Township of Paipoonge, under the jurisdiction of the Lakehead Region Conservation Authority, were designated by the Honourable Alan W. Pope, Ontario Minister of Natural Resources, and the Honourable Charles Caccia, Minister of Environment Canada, on August 5, 1983. The Kaministiquia River Public Information Flood Risk Maps were distributed to federal, provincial and municipal agencies, and were displayed at the Biennial Conservation Authority Tour held September 18 - 21, 1983.

- The Steering Committee agreed to recommend to the two ministers an amendment to the current Flood Damage Reduction Program Agreement. The amended agreement proposes that the mapping component receive additional finances of $7,400,000, for a total program funding of $15,400,000, to be expended by March 31, 1990. Also, the Steering Committee is requesting additional funding of $1,000,000 for the other measures component, for a total cost of $2,200,000, to be spent by March 31, 1992. It was further proposed that the amended agreement terminate on March 31, 1995.

- The Steering Committee, with assistance from the Ontario Ministry of Natural Resources Regional Offices, reviewed and set priorities for future floodline mapping and designations. The Steering Committee is proposing revisions to "Schedule A - Study Areas" under the amended agreement to reflect this priority setting exercise.

- "Schedule C - Surveys and Mapping Procedures" was revised to accommodate upgraded mapping specifications.

- A Water Management Study of the Muskoka River Watershed was initiated in 1983 at an estimated cost of $129,000. The study consultant is MacLaren Plansearch Inc. A set of public information meetings was held in July, 1983 at Huntsville, Dorset and Port Carling. It is anticipated that the study will be completed by Fall of 1984.

- Work commenced on the Regional Flood Analysis. The intent of this study is to develop design flows for watersheds where no streamflow data exists. This is a revision and enlargement of an earlier Environment Canada study. It is anticipated that the study will be completed in 1984/85.

- A procedure for the recognition of provincial "Special Policy Areas" under the Flood Damage Reduction Program was developed.

- The Canada/Ontario Flood Damage Reduction Program Agreement and Schedules were published in booklet form.

- The Catalogue of Flood Plain Mapping in the province of Ontario was revised and updated.

- The Steering Committee developed a Public Information Strategy for the program.

- A press conference was held in Sturgeon Falls on May 19, 1983, where the Public Information Flood Risk Maps for the Sturgeon River/Lake Nipissing/French River Watershed were presented to the public. Mr. M. Mantha, Chairman of the Sturgeon River/Lake Nipissing/French River Watershed Advisory Board was Chairman of the conference.

- A public information meeting was held in Atikokan on August 31, 1983 to present the draft Public Information Flood Risk Map to the municipal council and residents.

- Members of the Technical Subcommittee attended and actively participated in the National Technical Subcommittee Workshop held in Ottawa in February 1984.

ACTIVITIES PLANNED FOR THE 1984/85 YEAR

- The Steering Committee will assist in negotiating and implementing the amended Flood Damage Reduction Program Agreement.

- The Steering Committee will ensure that the Water Management Improvement Study of the Muskoka River System is complete, and will present the study's recommendations to the two ministers.

- The Steering Committee plans to undertake a Depth Damage Curve Development Project. The intent of this study is to establish a data base of potential flood damages to a representative sample of homes in Ontario. The curves developed from this study will be used to evaluate potential benefits resulting from proposed flood control measures.

- The Steering Committee will update and revise the Flood Damage Reduction Program's "General Program Information Package."

- The Steering Committee intends to hold an Information Meeting with federal departments and provincial ministries to explain the implementation of the Flood Damage Reduction Program in Ontario.

- When the Flood Plain Criteria Review is completed, the Steering Committee intends to prepare Public Information Flood Risk Maps for the purpose of carrying out designation of flood risk areas as follows:

Conservation Authority/ Municipality	Whole/Portions of Watercourses	Whole/Portions of Municipalities
Ausable Bayfield Conservation Authority	Ausable River, Benn, Walker and Whitfield Drains	Township of Stephen Village of Grand Bend Village of Lucan
Grand River Conservation Authority	Galt, Hanlons and Irish Creeks	City of Cambridge Township of North Dumfries Township of Puslinch
Lower Trent Region Conservation Authority	Trent River, Barnham House, Butler, Colborne, Glen Miller, Killoran, Mayhew, Mill, Rawdon, Shelter Valley and Trout Creeks	City of Trenton Town of Campbellford Township of Brighton Township of Haldimand Township of Seymour Township of Sidney Village of Brighton Village of Colborne Village of Frankford Village of Hastings Village of Stirling Village of Warkworth
Maitland Valley Conservation Authority	Lake Huron Shoreline	Township of Ashfield Township of Colborne Township of Goderich
South Lake Simcoe Conservation Authority	Beaverton River Pefferlaw Creek	Township of Brock Township of Georgina Township of Uxbridge

Conservation Authority/ Municipality	Whole/Portions of Watercourses	Whole/Portions of Municipalities
Upper Thames River Conservation Authority	Thames River	Town of St. Marys
Township of Atikokan	Atikokan River	Township of Atikokan
Town of Espanola	Spanish River Darkie Creek	Town of Espanola
Township of James	Elk Lake	Township of James
Townsnip of McNab	Ottawa River	Township of McNab
Township of Petawawa	Ottawa River	Township of Petawawa
Town of Thessalon	Thessalon River	Town of Thessalon
Township of Wicksteed	Little Jackfish River	Township of Wicksteed
Unorganized Municipalities	Goulais River	Township of Doerche Township of Fenwick Township of Hodgins Township VanKoughnet

Work will begin on Public Information Flood Risk Maps for the following areas:

Mississippi Valley Conservation Authority	Carp River Mississippi River Indian Creek Poole Creek Watts Creek	Town of Almonte Town of Carleton Place Township of Beckwith Township of Pakenham Township of West Carleton
Moira River Conservation Authority	Moira River Bell Creek	City of Belleville Township of Elzevir and Grimsthorpe Township of Huntingdon Township of Rawdon Township of Thurlow
Rideau Valley Conservation Authority	Rideau River	Regional Municipality of Ottawa-Carleton
St. Clair Region Conservation Authority	Sydenham River	Town of Dresden

PROGRAM FRAMEWORK

The agreement respecting the production of Public Information Flood Risk Maps and other flood damage reduction measures in the province of Ontario has, as its prime objectives, the reduction of potential damage on flood plains and along the shores of its rivers and lakes, and the reduction of risk relating to loss of life. The agreement advocates a preventative approach to flood control by discouraging future flood vulnerable developments within the flood plain.

The engineering maps and Public Information Flood Risk Maps are prepared with the intent of designation. Designation means that the policies set out in the agreement will be adhered to by the federal and provincial governments.

The policies are:

- No future federal or provincial government buildings or structures that are vulnerable to flood damage will be placed in the flood risk area;
- Funds from provincial or federal government sources, such as the Canada Mortgage and Housing Corporation, will no longer be available for new buildings or structures placed in the flood risk area and subject to flood damage;
- Any buildings or structures vulnerable to flood damage placed in the flood risk area after designation will not be eligible for flood disaster assistance; and
- The federal government and the Government of Ontario will encourage local municipalities to adopt official plan policies and zoning restrictions on development in the flood risk area.

The agreement came into effect on April 1, 1977. Currently, in accordance with revisions to the agreement, the mapping portion will be completed by March 31, 1985 and the policy implementation of the program will run to March 31, 1990.

A maximum cost of $9,200,000 over the period of the agreement will be shared equally by each government. Of this amount, $8,000,000 is to be spent on flood plain delineation, with the remaining $1,200,000 for other measures, as described in section 14 of the agreement. The areas to be mapped under this program are identified in Appendix A.

Administration of the program is the responsibility of the Steering Committee, whose members are listed in Appendix B. Members of the Technical Subcommittee are identified in Appendix C.

The Flood Damage Reduction Program is implemented through the local Conservation Authorities and organized municipalities for the majority of studies. These Conservation Authorities were established under The Conservation Authorities Act of the province of Ontario. Among other responsibilities, the Conservation Authorities regulate development in high flood risk areas, once these areas are identified. In this regard, the agreement enhances the objectives of the provincial program which has been in effect for some time.

WORK APPROACH

Flood risk maps are prepared and, in some cases, flood reduction measures studies conducted, for interested Conservation Authorities and municipalities in the province, primarily in urban areas, and along 20 river systems and many lakeshores (Appendix A).

The flood risk areas defined by the regulatory flood and/or the 100-year flood event, whichever is greater, are depicted on maps for public distribution at a scale usually between 1:5,000 and 1:25,000. Designation of these flood risk areas under the agreement requires that the signatures of the Minister of the Environment for Canada and the Minister of Natural Resources for Ontario are on the Public Information Flood Risk Maps.

The program undertaken consists of four major components: (1) Surveys and Mapping; (2) Hydrologic Analysis; (3) Hydraulics Analysis; and (4) Public Information.

The hydrological component of the study involves determining the response of a watershed to a major climatic event such as a rain storm, rapid snowmelt, or a combination of the two. The output from this hydrologic component, in the form of flood flows for specified periods, serves as input to the hydraulic component. At this point, detailed topographic maps are prepared and the river geometry is obtained from these maps. The hydraulic analysis defines the behavior of the river reaches under consideration and the high flood risk areas are identified. The output from the hydraulic studies is drawn on the topographic map to delineate the extent of the flood plain.

The final component of the program involves the development of maps, brochures and other interpretative information on the hazards of flooding for the information of the public, government departments, private companies and other agencies.

In centres where other flood damage reduction measures are deemed necessary, an analysis of factors affecting land use will be conducted, an evaluation of structural and non-structural alternatives carried out, and recommendations made on the basis of effectiveness, cost, resultant benefits and environmental impact.

APPENDIX A

Study Areas

All flood vulnerable sections of streams and, where applicable, Great Lakes shorelines under the jurisdiction of the following Conservation Authorities:

Ausable Bayfield
Cataraqui Region
Catfish Creek
Central Lake Ontario
Credit Valley
Crowe Valley
Essex Region
Ganaraska Region
Grand River
Halton Region
Hamilton Region
Kawartha Region
Kettle Creek
Lakehead Region
Long Point Region
Lower Thames Valley
Lower Trent Region
Maitland Valley
Mattagami Region
Metropolitan Toronto and Region
Mississippi Valley
Moira River
Napanee Region
Niagara Peninsula
Nickel District
North Bay - Mattawa
North Grey Region
Nottawasaga Valley
Otonabee Region
Prince Edward Region
Raisin Region
Rideau Valley
Sauble Valley
Saugeen Valley
Sault Ste. Marie Region
South Lake Simcoe
South Nation River
St. Clair Region
Upper Thames River.

The flood vulnerable sections of the following river systems that are not under the jurisdiction of Conservation Authorities:

Albany
Attawapiskat
Black (Washago)
English - Wabigoon
Goulais
Lake of the Woods
Magnetawan
Mississagi
Montreal
Moose
Muskrat
Nipigon
Ottawa - St. Lawrence
Rainy Lake
Severn (Northern Ontario)
Severn (Southern Ontario)
Spanish
Sturgeon - French
Wanapitei
Winisk.

APPENDIX B

Steering Committee

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The Committee held nine meetings during the year, eight in Toronto and one by conference call.

APPENDIX C

Technical Subcommittee

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The Committee held seven meetings during the year, six in Toronto and one in Ottawa.

APPENDIX D

Progress Reports (1983/84)

ALGONQUIN REGION

Township of Anson Hindon and Minden

The floodline mapping study for the Gull River at an estimated cost of $55,000 is in progress. Topographic maps and hydrologic analysis have been completed.

Study Consultant: Paragon Engineering Ltd.
Mapping Contractor: McElhanney Surveying and Engineering Ltd.

Muskoka Water Management Study

The main purpose of this study is to identify the requirements of the competing user groups in the watershed (Phase I), considering current operating restrictions (Phase II) and to develop a general water management strategy that will achieve community acceptance (Phase III). Phase I was completed in 1983/84, and it is anticipated that Phases II and III will be completed in 1984/85. The estimated cost of the study is $130,000.

Study Consultant: MacLaren Plansearch Inc.

Townships of McNab and Petawawa

Work commenced in 1983/84 on the Public Information Flood Risk Maps for the Ottawa River along these Townships.

CENTRAL REGION

Credit Valley Conservation Authority

A two-year Flood Damage Centre Analysis Study for the Credit River was initiated in 1982/83, at an estimated cost of $300,000. This estimate has subsequently been revised to $321,828. Topographic maps and hydrology for the study are complete. The study involves the identification and mapping of over twenty-five flood damage centres and the development of flood damage alternatives.

Study Consultant: Phillips Planning and Engineering Ltd.
Mapping Contractor: J. D. Barnes, Surveyors Ltd.

Grand River Conservation Authority

The Galt/Irish Creek Study, estimated at $112,143, is in progress. Preparation of topographic maps is completed, and preliminary hydrology is now complete.

Study Consultant: MacLaren Plansearch Inc.
Mapping Contractor: J. D. Barnes, Surveyors Ltd.

The Hanlon's Creek Study was completed in 1983/84 at a cost of $61,900.

Study Consultant: Phillips Planning and Engineering Ltd.
Mapping Contractor: Northway-Gestalt Corporation

The Nith and Conestogo studies commenced during 1983/84 and will be phased over a two-year period at an estimated cost of $210,000 and $90,000 respectively.

Nith Study Consultant: M. M. Dillon Ltd.

Conestogo Study Consultant: Proctor and Redfern Ltd.

Nith Mapping Contractor: Northway-Gestalt Corporation

Conestogo Mapping Contractor: Air Map Ltd.

Halton Region Conservation Authority

Additional work is in progress on the Bronte Creek Floodline Mapping Study to model certain critical areas where divided flow and inter-basin spill have been identified. The study is expected to be completed in early 1984/85. The total estimated cost of the project is $176,400.

Study Consultant: Proctor and Redfern Ltd.
Mapping Contractor: Northway-Gestalt Corporation

The two-year floodline mapping study for Sixteen Mile Creek commenced during 1983/84, and the topographic mapping and hydrology are in progress. The total estimated cost of the study is $162,000.

Study Consultant: Proctor and Redfern Ltd.
Mapping Contractor: Kenting Earth Sciences Ltd.

Niagara Peninsula Conservation Authority

The Black and Beaver Floodline Mapping Study, initiated in 1979/80, has experienced delays to its completion. The Technical Subcommittee determined during 1983/84 that the routine hydrologic modelling procedures employed by the consultant, were inappropriate, given the nature of the watershed, and subsequently recommended that a study employing dynamic modelling methods be undertaken to estimate flood discharges. This study was undertaken by Environment Canada. The design flows will now be used by the study consultant, De Leuw Cather Ltd., to complete the hydraulic analysis and prepare the floodline maps during 1984/85. A revised estimated cost of the study is $117,000.

Study Consultant: De Leuw Cather Ltd.
Mapping Contractor: Northway-Gestalt Corporation

The Welland River Floodline Mapping Study, initiated in 1980/81, is being carried out in three phases at a total estimated cost of $315,000. All topographic maps and hydrology are complete. Hydraulic analysis for Phases I and II is essentially complete, and the hydrodynamic modelling exercise, initiated as Phase III, is expected to be completed during 1984/85. The three phases identify various reaches of the river.

Study Consultant, Phases I and II: Kilborn Engineering Ltd.
Study Consultant, Phase III: M. M. Dillon Ltd.
Mapping Contractor, Phases I, II and III: J. D. Barnes, Surveyors Ltd.

South Lake Simcoe Conservation Authority

The Pefferlaw/Beaverton Floodline Mapping Study is nearing completion, at an estimated cost of $528,000. Completion has been delayed due to several changes that the consultant has had to make to complete the final hydrologic and hydraulic reports.

Study Consultant and Mapping Contractor: Marshall Macklin and Monaghan Ltd.

The floodline mapping study for the Holland River commenced during 1983/84. Topographic mapping and hydrology studies are in progress. The study is estimated to cost $292,900.

Study Consultant: Cumming-Cockburn and Associates Ltd.
Mapping Contractor: Northway-Gestalt Corporation

Work was initiated in 1983/84 on the Public Information Flood Risk Maps for the Pefferlaw/Beaverton Floodline Mapping Study.

EASTERN REGION

Cataraqui Region C.A.

The Gananoque Watershed Management Study, originally phased over a three-year period, is in progress with the topographic mapping and hydrologic analysis completed. The estimated cost of this project is $297,000.

Study Consultant: The Lathem Group Inc.
Mapping Contractor: Northway-Gestalt Corporation

The floodline mapping study of the Little Cataraqui Creek is nearing completion with hydrology, preliminary hydraulics and floodline maps complete. The estimated cost of the study is $53,600.

Study Consultant: A. J. Robinson and Associates Inc.
Mapping Contractor: Northway-Gestalt Corporation

Lower Trent Region Conservation Authority

Work commenced in 1983/84 on the production of Public Information Flood Risk Maps for watercourses mapped under and outside of the Flood Damage Reduction Program.

Mississippi Valley Conservation Authority

The Mississippi River study was completed during 1983/84, at a cost of $223,534.

Study Consultant: Cumming-Cockburn and Associates Ltd.
Mapping Contractor: Northway-Gestalt Corporation

The floodline mapping study for 168 km of the Ottawa River (Regional Municipality of Ottawa-Carleton) shoreline was initiated in 1981/82 at an estimated cost of $300,711. The study covers the jurisdiction of the Mississippi Valley and Rideau Valley Conservation Authorities, and extends to some municipalities outside the Conservation Authorities. The hydrology, preliminary hydraulics and floodline maps are complete for 60 km of shoreline.

Study Consultant: MacLaren Plansearch Inc.
Mapping Contractor: Northway-Gestalt Corporation

A floodline mapping study for Shirley's Brook and the Kizell Drain (Hardwood Creek), with an estimated cost of $52,800, is nearing completion with hydrology, preliminary hydraulics and floodline maps completed.

Study Consultant: A. J. Robinson and Associates Inc.
Mapping Contractor: Northway-Gestalt Corporation

Moira River Conservation Authority

The Water Management Study for Bell Creek was completed in 1983/84, at a cost of $75,107.

Study Consultant: MacLaren Plansearch Inc.
Mapping Consultant: J. D. Barnes, Surveyors Ltd.

Rideau Valley Conservation Authority

The floodline mapping study of the Rideau River was completed in 1983/84 at a cost of $35,576.

Study Consultant: A. J. Robinson and Associates Inc.
Mapping Contractor: Northway-Gestalt Corporation

NORTH CENTRAL REGION

Township of Atikokan

Work commenced on the Public Information Flood Risk Map for the Atikokan River.

Township of Nipigon

The floodline mapping study for the Nipigon River is in progress, at an estimated cost of $21,000. Topographic mapping and preliminary hydrology were completed.

Study Consultant: Proctor and Redfern Ltd.
Mapping Contractor: None (mapping provided by the Ontario Base Mapping Program)

NORTHEASTERN REGION

Nickel District Conservation Authority

Engineering studies were initiated in 1981/82 to determine flood levels for the Vermilion River, Vermilion Lake, Wanup (Wanapitei River), Coniston Creek and Whitefish River, at an estimated cost of $175,000. Topographic mapping of the study was completed in 1980/81. The Vermilion Lake and Vermilion River studies were completed at a cost of $32,838 and $44,114 respectively. The Wanup study was completed at a cost of $58,504, and the Coniston and Whitefish studies were completed at a cost of $51,500.

Vermilion River and Lake Study Consultant: Albery, Pullerits, Dickson and Associates
Coniston and Whitefish Study Consultant: M. M. Dillon Ltd.
Wanup Study Consultant: S. A. Kirchhefer Ltd.

Town of Thessalon

Floodline mapping of the Thessalon River in the Town of Thessalon was completed during 1983/84 at a cost of $30,836.

Study Consultant: Dennis Consultants Ltd.
Mapping Contractor: C. G. Trivers Ltd./Ontario Base Mapping Program

Goulais River (Townships of Fenwick, VanKoughnet, Doerche and Hodgins)

The floodline mapping study of the Goulais River was completed during 1983/84 at a cost of $134,765.

Study Consultant: Fenco Engineers Inc.
Mapping Contractor: J. D. Barnes, Surveyors Ltd.

NORTHERN REGION

Town of Hearst

A floodline mapping study initiated in 1983/84 for the Nattawishkwia River is in progress. The study is estimated to cost $18,360.

Study Consultant: Northland Engineering Ltd.
Mapping Contractor: McElhanney Surveys and Engineering Ltd./Ontario Base Mapping Program

Town of Chapleau

A floodline mapping study for the Kebsquasheshing River, the Nebskwashi River and Bucciarelli in the Town of Chapleau is in progress. The estimated cost of the study is $21,447.

Study Consultant: Northland Engineering Ltd.
Mapping Contractor: Kenting Earth Sciences Ltd./Ontario Base Mapping Program

SOUTHWESTERN REGION

Ausable Bayfield Conservation Authority

Floodline mapping for the Towns of Grand Bend (Walker Drain), Crediton (Ausable River) and Lucan (Benn Drain, Whitfield Drain) is nearing completion at an estimated cost of $40,000. Topographic maps, preliminary hydrology and hydraulics are now complete. Existing topographic maps, along with supplementary mapping prepared under this program, are being used for delineating floodlines.

Study Consultant: Proctor and Redfern Ltd.
Mapping Contractor: Northway-Gestalt Corporation

Essex Region Conservation Authority

The Steering Committee decided not to provide funding for flood control works for the channelization project proposed for the Township of Sandwich West (Turkey Creek) after cost-benefit analyses carried out for the project indicated that it was not economically feasible.

Work was initiated on the Public Information Flood Risk Maps for all the watercourses mapped in the Conservation Authority.

Maitland Valley Conservation Authority

The Lake Huron Shoreline Mapping Study was initiated in 1983/84 at an estimated cost of $50,000. The study will be completed in 1984/85, with hydrotechnical analysis carried out by the Ontario Ministry of Natural Resources and Environment Canada.

Mapping Contractor: J. D. Barnes, Surveyors Ltd.

Upper Thames River Conservation Authority

The floodline mapping study for the Avon River at Stratford was completed during 1983/84 at a cost of $36,143.

Study Consultant: Cumming-Cockburn and Associates Ltd.
Mapping Contractor: Photomap Air Surveys Ltd.

The Town of St. Marys Flood Damage Reduction Study, done outside the Flood Damage Reduction Program was reviewed by the Technical Subcommittee with the intention of preparing Public Information Flood Risk Maps. The study was found to be adequate for this purpose.

APPENDIX E

Hydrotechnical Studies Completed

Conservation Authority/ Municipality	Whole/Portions of Watercourses	Whole/Portions of Municipalities	Date Designated
Algonquin Region			
Township of McNab	Ottawa River	Township of McNab	
Township of Petawawa	Ottawa River	Township of Petawawa	
Central Region			
Central Lake Ontario Conservation Authority	Robinson Creek	Town of Newcastle	
Grand River Conservation Authority	Hanlon's Creek	Township of Puslinch	
Metropolitan Toronto and Region Conservation Authority	Don River Humber River Rouge River Duffin Creek Etobicoke Creek Highland Creek Mimico Creek Petticoat Creek	Municipality of Metroplitan Toronto Regional Municipality of Durham Regional Municipality of York	December 9, 1982
Niagara Peninsula Conservation Authority	Twenty Mile Creek	Township of West Lincoln	
Nottawasaga Valley Conservation Authority	Willow Creek	Township of Oro	

Conservation Authority/ Municipality	Whole/Portions of Watercourses	Whole/Portions of Municipalities	Date Designated
<u>Eastern Region</u>			
Lower Trent Region Conservation Authority	Trent River Colborne Creek Mill Creek Trout Creek	City of Trenton Town of Campbellford Township of Brighton Township of Haldimand Township of Seymour Township of Sidney Village of Brighton Village of Colborne Village of Frankford Village of Hastings Village of Sterling Village of Warkworth	
Mississippi Valley Conservation Authority	Carp River Mississippi River Indian Creek Poole Creek Watts Creek	Town of Almonte Town of Carleton Place Township of Beckwith Township of Pakenham Township of West Carleton	
Moira River Conservation Authority	Moira River Bell Creek	City of Belleville Township of Elzevir and Grimsthorpe Township of Huntingdon Township of Rawdon Township of Thurlow	
Rideau Valley Conservation Authority	Rideau River	Regional Municipality of Ottawa-Carleton	

Conservation Authority/ Municipality	Whole/Portions of Watercourses	Whole/Portions of Municipalities	Date Designated
North Central Region			
Lakehead Region Conservation Authority	Kaministiquia River	City of Thunder Bay Township of Neebing Township of Paipoonge	August 5, 1983
Township of Atikokan	Atikokan River	Township of Atikokan	
Northeastern Region			
Nickel District Conservation Authority	Vermilion Lake Vermilion River Wanapitei River Whitefish River Coniston Creek	City of Sudbury Town of Onaping Falls Town of Walden Township of Cleland	
Town of Espanola	Spanish River Darkie Creek	Town of Espanola	
Town of Thessalon	Thessalon River	Town of Thessalon	
Unorganized Municipalities	Goulais River	Township of Doerche Township of Fenwick Township of Hodgins Township of VanKoughnet	

Conservation Authority/ Municipality	Whole/Portions of Watercourses	Whole/Portions of Municipalities	Date Designated
Various Municipalities	Sturgeon River/Lake Nipissing/French River System	City of North Bay Town of Sturgeon Falls Township of Caldwell Township of Cosby, Mason and Martland Township of Nipissing Township of North Himsworth Township of Springer Township of Bigwood Township of Commanda Township of Delamere Township of Falconer Township of MacPherson Township of Mowat Township of Dunnet	March 31, 1983
Town of White River	White River Picnic Lake Picnic Creek	Town of White River	August 16, 1982
Northern Region			
Township of James	Montreal River	Township of James	
Township of Wicksteed	Little Jackfish River	Township of Wicksteed	

TABLE 1

EXPENDITURES FOR THE CANADA/ONTARIO FLOOD DAMAGE REDUCTION PROGRAM

MAPPING COSTS

CONSERVATION AUTHORITY	1983/84	1982/83	1981/82	1980/81	1979/80	1977-79	TOTAL ACCUMULATED
Ausable-Bayfield	$ 7,900.00	$ 27,100.00	$	$	$	$	$ 35,000.00
Cataraqui Region	17,186.02	99,195.51	73,706.53	88,951.70			279,039.76
Central Lake Ontario					22,133.00		22,133.00
Credit Valley	137,392.42	157,888.73					295,281.15
Essex Region	4,645.55	27,816.00	224,312.20	80,573.78			337,347.53
Grand River	113,182.51	80,269.40	49,449.79	2,383.58	39,255.00	83,591.00	368,131.28
Halton Region	124,718.37	94,528.83	99,300.00	4,232.24			322,779.44
Lakehead Region		1,535.94					1,535.94
Lower Trent Region	930.20	7,117.81	88,062.64	121,090.56	35,000.00		252,201.21
Metropolitan Toronto & Region		41,587.00	71,905.32			622,200.00	735,692.32
Mississippi Valley	78,792.37	147,742.02	18,520.96	109,854.16	68,973.00		423,882.51
Moira River	35,680.66	223,500.38	82,307.42				341,488.46
Niagara Peninsula	33,091.30	18,417.17	156,904.92	77,000.00	25,000.00		310,413.39
Nickel District	39,328.25	91,142.98	45,441.98	443,470.00	110,600.00		729,983.21
Nottawasaga Valley		1,111.48	34,212.64	959.65			36,283.77
Otonabee Region			131,802.00	2,045.00	19,056.00		152,903.00
Rideau Valley	67,577.41	87,149.72					154,727.13
South Lake Simcoe	136,291.56	4,977.32	73,561.38	55,780.00	353,221.00		623,831.26
St. Clair Region				7,365.00			7,365.00
Upper Thames River	36,143.10	53,855.77	66,723.01	50,370.33			207,092.21
SUB-TOTAL #1	$ 832,859.72	$1,164,936.06	$1,216,210.79	$1,044,076.00	$ 673,238.00	$ 705,791.00	$5,637,111.57

T A B L E 1 (Continued)

EXPENDITURES FOR THE CANADA/ONTARIO FLOOD DAMAGE REDUCTION PROGRAM

MAPPING COSTS

CONSERVATION AUTHORITY	1983/84	1982/83	1981/82	1980/81	1979/80	1977-79	TOTAL ACCUMULATED
MUNICIPALITIES OUTSIDE C.A.'s							
Atikokan	$ 1,139.54	$ 28,451.81	$	$	$	$	$ 29,591.35
Anson, Hindon & Minden	39,370.98						39,370.98
Chapleau	5,307.56						5,307.56
Espanola	1,456.65	175.94	23,573.02	37,998.08			63,203.69
Goulais River	99,500.18	35,265.19					134,765.37
Hearst	2,235.11						2,235.11
James		49,244.52	5,641.44				54,885.96
Lake Nipissing		34,012.77	136,619.50				170,632.27
McNab		28,881.00					28,881.00
Nipigon	11,332.99						11,332.99
Ottawa River - RMOC	20,398.50	26,332.59					46,731.09
Ottawa River - Rockland	295.60						295.60
Petawawa		34,140.00					34,140.00
Thessalon	1,062.52	3,253.14	26,520.61				30,836.27
White River			7,501.00	10,499.00			18,000.00
Wicksteed	956.36	7,565.02	4,859.12				13,380.50
Administration	53,871.54	44,983.87					98,855.41
EMR Review	12,803.00	29,530.58	18,191.02	9,899.00	1,532.00		71,955.60
SUB-TOTAL #2	$ 249,730.53	$ 321,836.43	$ 222,905.71	$ 58,396.08	$ 1,532.00	$	$ 854,400.75

T A B L E 1 (Continued)

EXPENDITURES FOR THE CANADA/ONTARIO FLOOD DAMAGE REDUCTION PROGRAM

OTHER MEASURES	1983/84	1982/83	1981/82	1980/81	1979/80	1977-79	TOTAL ACCUMULATED
Studies							
MTRCA	$	$	$	$ 36,825.92	$ 41,858.00	$	$ 78,683.92
Muskoka River Management	98,872.99						98,872.99
Lake Nipissing			21,700.75	162,656.62	98,073.00		282,430.37
Public Relations							
Slide Show				1,197.58	619.00		1,816.58
National Brochure				5,458.30			5,458.30
Ontario Brochure		1,774.00	7,947.65				9,721.65
Film				20,000.00			20,000.00
Display					1,000.00		1,000.00
Works							
White River Embankment	1,817.25	33,803.47					35,620.72
SUB-TOTAL #2	$ 100,690.24	$ 35,577.47	$ 29,648.40	$ 226,138.42	$ 141,550.00	$	$ 533,604.53
Audit Adjustment	$ (19,520.00)						$ (19,520.00)
GRAND TOTAL (1 + 2 + 3)	$1,163,760.49	$1,522,349.96	$1,468,764.90	$1,328,610.50	$ 816,320.00	$ 705,791.00	$7,005,596.85